

WHAT IS CLAIMED IS:

1. A touch fastener component having a sheet-form base and an array of fastener elements, each fastener element comprising:

a stem extending outwardly from and integrally with the sheet-form base, and

two heads extending in essentially opposite directions in an engagement plane from a distal end of the stem to corresponding tips, the fastener element having an upper surface that defines a well between the heads;

wherein a height of a lowermost extent of the well, measured from and perpendicular to the sheet-form base, is less than 60 percent of an overall height of the fastener element, measured perpendicular to the sheet-form base.

2. The touch fastener component of claim 1 wherein the height of the lowermost extent of the well is at least about 70 percent of an overall height of one of the two oppositely-directed heads, measured perpendicular to the base from the tip of the head to an uppermost extent of the head.

3. The touch fastener component of claim 1 wherein each fastener element has an overall length between opposite extents of the heads, measured parallel to the base, of at least 1.8 times the overall height of the fastener element.

4. The touch fastener component of claim 1 wherein each fastener element head tip defines an entrance height, measured perpendicular to the sheet-form base below a lowermost extent of the tip, of between about 7 and 12 millimeters.

5. The touch fastener component of claim 1 wherein a ratio of an overall height of each crook, measured perpendicular to the sheet-form base from a lowermost extent of the corresponding tip to an uppermost extent of the crook, to an entrance height measured perpendicular to the sheet-form base below a lowermost extent of the corresponding tip, is greater than 0.6.

6. The touch fastener component of claim 1 wherein an overall height of one of the two oppositely-directed heads, measured perpendicular to the base from the tip of the head to an uppermost extent of the head, is less than 60 percent of the overall height of the fastener element.

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7. The touch fastener component of claim 1 wherein a ratio of an overall length of the fastener element, measured parallel to the sheet-form base in the engagement plane, to the height of the lowermost extent of the well, is greater than 2.5.

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8. The touch fastener component of claim 1 wherein each fastener element has a mold release factor, defined as a ratio of a difference between a minimum solid length of the stem, measured parallel to the sheet-form base in side view, and a maximum solid length of the fastener element, measured parallel to the sheet-form base in side view above an elevation corresponding to the minimum solid length, to the minimum solid length of the stem, of less than 0.1.

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9. The touch fastener component of claim 1 wherein at least one of the heads has an overall height, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head, that is greater than half of an overall height of the fastener element, measured perpendicular to the sheet-form base.

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10. The touch fastener component of claim 1 wherein the tips extend toward the base.

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11. The touch fastener component of claim 1 wherein the lower surfaces of the heads are arched.

12. The touch fastener component of claim 1 wherein the heads and stem form a unitary molded structure.

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13. The touch fastener component of claim 1 wherein the heads have surfaces of resin cooled against mold surfaces.

14. The touch fastener component of claim 1 wherein the stem has opposing
5 surfaces defined by severed resin.

15. The touch fastener component of claim 1 wherein the stem and heads have side surfaces lying in parallel planes.

10 16. The touch fastener component of claim 1 wherein the crooks overhang surfaces of the stem.

17. The touch fastener component of claim 16 wherein the crooks overhang stem surfaces that extend at an inclination angle of between about 20 and 30 degrees with respect
15 to a normal to the base.

18. The touch fastener component of claim 1 wherein each fastener element has an overall height of between about 10 and 50 millimeters, measured from and perpendicular to the base.

20 19. The touch fastener component of claim 18 wherein each fastener element has an overall height of between about 20 and 30 millimeters.

20. The touch fastener component of claim 1 wherein each fastener element head
25 has an overall height of between about 10 and 20 millimeters, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head.

21. The touch fastener component of claim 1 wherein the height of the lowermost
30 extent of the well is between about 5 and 20 millimeters.

22. The touch fastener component of claim 21 wherein the height of the lowermost extent of the well is between about 10 and 15 millimeters.

23. The touch fastener component of claim 1 wherein each crook defines an overall crook height, measured perpendicular to the sheet-form base from a lowermost extent of the tip to an uppermost extent of the crook, of at least 6.0 millimeters.

24. The touch fastener component of claim 1 further comprising a backing material laminated to a side of the base opposite the fastener elements.

25. The touch fastener component of claim 1 wherein the fastener elements are arranged in a density of at least 350 fastener elements per square inch of the base.

26. The touch fastener component of claim 1 wherein the fastener elements together cover at least 20 percent of an overall surface area of the base from which the fastener elements extend.

27. A touch fastener component having a sheet-form base and an array of fastener elements, each fastener element comprising:

a stem extending outwardly from and integrally with the sheet-form base, and two heads disposed at a distal end of the stem and extending in essentially opposite directions in an engagement plane to corresponding tips, the fastener element having an upper surface that defines a well between the heads;

wherein a ratio of an overall height of at least one of the heads, measured perpendicular to the sheet-form base from a lowermost extent of the tip to an uppermost extent of the head, to a height of a lowermost extent of the well, measured from and perpendicular to the sheet-form base, is greater than 0.7.

28. The touch fastener component of claim 27 wherein each fastener element has an overall length between opposite extents of the heads, measured parallel to the base, of at

least 1.8 times an overall height of the fastener element, measured from and perpendicular to the base.

29. The touch fastener component of claim 27 wherein each fastener element head
5 tip defines an entrance height, measured perpendicular to the sheet-form base below a lowermost extent of the tip, of between about 7 and 12 millimeters.

30. The touch fastener component of claim 27 wherein a ratio of an overall height
10 of each crook, measured perpendicular to the sheet-form base from a lowermost extent of the corresponding tip to an uppermost extent of the crook, to an entrance height measured perpendicular to the sheet-form base below a lowermost extent of the corresponding tip, is greater than 0.6.

31. The touch fastener component of claim 27 wherein the overall height of one
15 of the two oppositely-directed heads is less than 60 percent of an overall height of the fastener element, measured from and perpendicular to the base.

32. The touch fastener component of claim 27 wherein a ratio of an overall length
20 of the fastener element, measured parallel to the sheet-form base in the engagement plane, to the height of the lowermost extent of the well, is greater than 2.5.

33. The touch fastener component of claim 27 wherein each fastener element has
a mold release factor, defined as a ratio of a difference between a minimum solid length of the stem, measured parallel to the sheet-form base in side view, and a maximum solid length
25 of the fastener element, measured parallel to the sheet-form base in side view above an elevation corresponding to the minimum solid length, to the minimum solid length of the stem, of less than 0.1.

34. The touch fastener component of claim 27 wherein at least one of the heads
30 has an overall height that is greater than half of an overall height of the fastener element, measured from and perpendicular to the sheet-form base.

35. The touch fastener component of claim 27 wherein the tips extend toward the base.

5 36. The touch fastener component of claim 27 wherein the crooks overhang surfaces of the stem.

37. The touch fastener component of claim 36 wherein the crooks overhang stem surfaces that extend at an inclination angle of between about 20 and 30 degrees with respect
10 to a normal to the base.

38. The touch fastener component of claim 27 wherein each fastener element has an overall height of between about 10 and 50 millimeters, measured from and perpendicular to the base.

15 39. The touch fastener component of claim 38 wherein each fastener element has an overall height of between about 20 and 30 millimeters.

40. The touch fastener component of claim 27 wherein each fastener element head
20 has an overall height of between about 10 and 20 millimeters.

41. The touch fastener component of claim 40 wherein each fastener element head has an overall height of about 15 millimeters.

25 42. The touch fastener component of claim 27 wherein the height of the lowermost extent of the well is between about 5 and 20 millimeters.

43. The touch fastener component of claim 42 wherein the height of the lowermost extent of the well is between about 10 and 15 millimeters.

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44. The touch fastener component of claim 27 wherein each crook defines an overall crook height, measured perpendicular to the sheet-form base from a lowermost extent of the tip to an uppermost extent of the crook, of at least 6.0 millimeters.

5 45. The touch fastener component of claim 27 further comprising a backing material laminated to a side of the base opposite the fastener elements.

46. The touch fastener component of claim 27 wherein the fastener elements are arranged in a density of at least 350 fastener elements per square inch of the base.

10 47. The touch fastener component of claim 27 wherein the fastener elements together cover at least 20 percent of an overall surface area of the base from which the fastener elements extend.

15 48. A touch fastener component having a sheet-form base and an array of fastener elements, each fastener element comprising:

a stem extending outwardly from and integrally with the sheet-form base, and
two heads disposed at a distal end of the stem and extending in essentially opposite directions in an engagement plane to corresponding tips, the fastener element having an
20 upper surface that defines a well between the heads;

wherein a ratio of an overall length of the fastener element, measured parallel to the sheet-form base in the engagement plane between opposite extents of the heads, to a height of a lowermost extent of the well, measured from and perpendicular to the sheet-form base, is greater than 2.5.

25 49. The touch fastener component of claim 48 wherein the overall length of the fastener element is at least 1.8 times an overall height of the fastener element, measured from and perpendicular to the base.

30 50. The touch fastener component of claim 48 wherein a ratio of an overall height of each crook, measured perpendicular to the sheet-form base from a lowermost extent of the

corresponding tip to an uppermost extent of the crook, to an entrance height measured perpendicular to the sheet-form base below a lowermost extent of the corresponding tip, is greater than 0.6.

5 51. The touch fastener component of claim 48 wherein an overall height of one of the two oppositely-directed heads, measured perpendicular to the base from the tip of the head to an uppermost extent of the head, is less than 60 percent of an overall height of the fastener element, measured from and perpendicular to the base.

10 52. The touch fastener component of claim 48 wherein each fastener element has a mold release factor, defined as a ratio of a difference between a minimum solid length of the stem, measured parallel to the sheet-form base in side view, and a maximum solid length of the fastener element, measured parallel to the sheet-form base in side view above an elevation corresponding to the minimum solid length, to the minimum solid length of the
15 stem, of less than 0.1.

 53. The touch fastener component of claim 48 wherein at least one of the heads has an overall height, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head, that is greater than half of an
20 overall height of the fastener element, measured perpendicular to the sheet-form base.

 54. The touch fastener component of claim 48 wherein the crooks overhang surfaces of the stem.

25 55. The touch fastener component of claim 54 wherein the crooks overhang stem surfaces that extend at an inclination angle of between about 20 and 30 degrees with respect to a normal to the base.

 56. The touch fastener component of claim 48 wherein each fastener element has
30 an overall height of between about 10 and 50 millimeters, measured from and perpendicular to the base.

57. The touch fastener component of claim 48 wherein each fastener element head has an overall height of between about 10 and 20 millimeters, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head.

58. The touch fastener component of claim 48 wherein the height of the lowermost extent of the well is between about 5 and 20 millimeters.

59. The touch fastener component of claim 48 wherein each crook defines an overall crook height, measured perpendicular to the sheet-form base from a lowermost extent of the tip to an uppermost extent of the crook, of at least 6.0 millimeters.

60. The touch fastener component of claim 48 further comprising a backing material laminated to a side of the base opposite the fastener elements.

61. A touch fastener component having a sheet-form base and an array of fastener elements, each fastener element comprising:

a molded stem extending outwardly from and integrally with the sheet-form base, and two heads disposed at a distal end of the stem and extending in essentially opposite directions in an engagement plane to corresponding tips, the fastener element having an upper surface that defines a well between the heads;

wherein each fastener element has a mold release factor, defined as a ratio of a difference between a minimum solid length of the stem, measured parallel to the sheet-form base in side view, and a maximum solid length of the fastener element, measured parallel to the sheet-form base in side view above an elevation corresponding to the minimum solid length, to the minimum solid length of the stem, of less than 0.1.

62. The touch fastener component of claim 61 wherein the mold release factor is less than 0.05.

63. The touch fastener component of claim 61 wherein the overall length of the fastener element is at least 1.8 times an overall height of the fastener element, measured from and perpendicular to the base.

5 64. The touch fastener component of claim 61 wherein a ratio of an overall height of each crook, measured perpendicular to the sheet-form base from a lowermost extent of the corresponding tip to an uppermost extent of the crook, to an entrance height measured perpendicular to the sheet-form base below a lowermost extent of the corresponding tip, is greater than 0.6.

10 65. The touch fastener component of claim 61 wherein an overall height of one of the two oppositely-directed heads, measured perpendicular to the base from the tip of the head to an uppermost extent of the head, is less than 60 percent of an overall height of the fastener element, measured from and perpendicular to the base.

15 66. The touch fastener component of claim 61 wherein at least one of the heads has an overall height, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head, that is greater than half of an overall height of the fastener element, measured perpendicular to the sheet-form base.

20 67. The touch fastener component of claim 61 wherein the crooks overhang surfaces of the stem.

25 68. The touch fastener component of claim 67 wherein the crooks overhang stem surfaces that extend at an inclination angle of between about 20 and 30 degrees with respect to a normal to the base.

30 69. The touch fastener component of claim 61 wherein each fastener element has an overall height of between about 10 and 50 millimeters, measured from and perpendicular to the base.

70. The touch fastener component of claim 61 wherein each fastener element head has an overall height of between about 10 and 20 millimeters, measured perpendicular to the sheet-form base from a lowermost extent of the tip of the head to an uppermost extent of the head.

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71. The touch fastener component of claim 61 wherein the height of the lowermost extent of the well is between about 5 and 20 millimeters.

72. A method of forming a touch fastener component having a sheet-form base and an array of fastener elements, the method comprising:

10 introducing molten resin to a peripheral surface of a rotating mold roll defining an array of inwardly-extending cavities each including

a stem region extending inwardly from the peripheral surface, and

15 two head regions extending laterally in essentially opposite directions in an engagement plane from a distal end of the stem region to corresponding, blind tips, an inner surface of the cavity extending radially outward to form a protrusion between the head regions;

20 wherein a radial distance from an outermost extent of the protrusion to the peripheral surface is less than 60 percent of an overall depth of the cavity, measured radially from the peripheral surface of the mold roll;

applying sufficient pressure to force the resin into the cavities to mold an array of fastener elements having upper wells corresponding to the protrusions, while forming a sheet of the resin on the peripheral surface of the mold roll;

cooling the resin in the cavities; and then

25 stripping the sheet of resin from the surface of the mold roll, thereby pulling heads of the fastener elements formed in the head regions of the cavities through the stem regions of the cavities to remove the fastener elements from the cavities.

73. A method of forming a touch fastener component having a sheet-form base and an array of fastener elements, the method comprising:

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introducing molten resin to a peripheral surface of a rotating mold roll defining an array of inwardly-extending cavities each including

a stem region extending inwardly from the peripheral surface, and

two head regions extending laterally in essentially opposite directions in an engagement plane from a distal end of the stem region to corresponding, blind tips, an inner surface of the cavity extending radially outward to form a protrusion between the head regions;

wherein a ratio of an overall height of at least one of the head regions, measured radially from an outermost extent of the tip to an innermost extent of the head region, to a radial distance from an outermost extent of the protrusion to the peripheral surface, is greater than 0.7;

applying sufficient pressure to force the resin into the cavities to mold an array of fastener elements having upper wells corresponding to the protrusions, while forming a sheet of the resin on the peripheral surface of the mold roll;

cooling the resin in the cavities; and then

stripping the sheet of resin from the surface of the mold roll, thereby pulling heads of the fastener elements formed in the head regions of the cavities through the stem regions of the cavities to remove the fastener elements from the cavities.

74. A method of forming a touch fastener component having a sheet-form base and an array of fastener elements, the method comprising:

introducing molten resin to a peripheral surface of a rotating mold roll defining an array of inwardly-extending cavities each including

a stem region extending inwardly from the peripheral surface, and

two head regions extending laterally in essentially opposite directions in an engagement plane from a distal end of the stem region to corresponding, blind tips, an inner surface of the cavity extending radially outward to form a protrusion between the head regions;

wherein a ratio of an overall length of the cavity, measured circumferentially between opposite extents of the head regions, to a radial distance from an outermost extent of the protrusion to the peripheral surface, is greater than 2.5;

applying sufficient pressure to force the resin into the cavities to mold an array of fastener elements having upper wells corresponding to the protrusions, while forming a sheet of the resin on the peripheral surface of the mold roll;

cooling the resin in the cavities; and then

5 stripping the sheet of resin from the surface of the mold roll, thereby pulling heads of the fastener elements formed in the head regions of the cavities through the stem regions of the cavities to remove the fastener elements from the cavities.

75. A method of forming a touch fastener component having a sheet-form base
10 and an array of fastener elements, the method comprising:

introducing molten resin to a peripheral surface of a rotating mold roll defining an array of inwardly-extending cavities each including

a stem region extending inwardly from the peripheral surface, and

15 two head regions extending laterally in essentially opposite directions in an engagement plane from a distal end of the stem region to corresponding, blind tips, an inner surface of the cavity extending radially outward to form a protrusion between the head regions;

wherein the cavity defines a mold release factor, defined as a ratio of a difference between a minimum circumferential open length of the stem region and a
20 maximum circumferential open length of the cavity at a tool roll radius smaller than that a radius corresponding to the minimum circumferential open length, to the minimum circumferential open length of the stem region, of less than 0.1;

25 applying sufficient pressure to force the resin into the cavities to mold an array of fastener elements having upper wells corresponding to the protrusions, while forming a sheet of the resin on the peripheral surface of the mold roll;

cooling the resin in the cavities; and then

stripping the sheet of resin from the surface of the mold roll, thereby pulling heads of the fastener elements formed in the head regions of the cavities through the stem regions of the cavities to remove the fastener elements from the cavities.